

Appendix A—Selected “Disease Causation–Exposure Relationships” Recognized by Public Health Authorities

Table A.1. Selected "Disease Causation – Exposure Relationships" Recognized by Public Health Authorities

Disease	Exposure	NLM Hazmap	ACGIH Doc. of TLV	ATSDR Tox Profile	EPA IRIS	NIOSH Occ. Health Guidelines	WHO/PCS (EHC)	Comment
Silicosis (all subtypes)	Silica	+	+	ND	+	+	ND	
Beryllium sensitization/CBD	Beryllium	+	+	+	+	+	+	
Asbestosis	Asbestos	+	+	ND	ND	+	+	
Lung fibrosis	Plutonium	+ ²	+	+ ³	ND	ND	ND	
	Uranium/ U mining	-	+	+ ⁴	ND	ND	+ ²	
	Welding fumes	-	ND	ND	ND	+	ND	
	Cobalt/Hard Metal	+	+	+	ND	+	ND	
	Yttrium (rare earth metal)	-	+ ⁷	ND	ND	-	ND	
COPD	Welding fumes	+	ND	ND	ND	+ ⁴	ND	

ND = no specific agency document on this exposure.

+ = relationship is recognized/acknowledged by the agency document.

- = this disease is not mentioned, recognized, or acknowledged in the agency document that summarizes or lists toxic effects of the exposure.

Note: a – sign does not necessarily mean that the agency found "no association."

Sources: NLM Hazmap: <http://hazmap.nlm.nih.gov/>; ACGIH Documentation of Threshold Limit Values 2005; ATSDR ToxProfiles 2004; EPA Integrated Risk Information System (IRIS) database www.epa.gov/iriswebp/iris/; NIOSH Occupational Health Guidelines for Chemical Hazards <http://www.cdc.gov/niosh/chem-inx.html>; World Health Organization/International Program in Chemical Safety Environmental Health Criteria <http://www.inchem.org/pages/ehc.html>.

² Plutonium listed as "fibrogenic."

³ Noted in animal studies.

⁴ Fibrosis in U miners noted, but attributed in narrative to concurrent exposure to other inorganic dusts.
⁵ NIOSH Criteria for a Recommended Standard: Welding, Brazing and Thermal Cutting. DHHS (NIOSH) Publication No. 88-110.

⁶ Cobalt linked to chronic interstitial pneumonitis.

⁷ Based on animal data.

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(Continued)

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COPD	Diesel exhaust	-	ND	ND	ND	-	-	
	Vanadium	+	+	-	⁸	+		
	Respiratory irritants (other)	+	ND	ND	ND	ND	ND	
Diabetes	-							None established ¹⁰
Chronic renal insufficiency	Cadmium	+	+	+	+	+	+	
	Chromium	+	+ ¹¹	+	-	-	+	
	Lead	+	+	+	-	+	+	
	Mercury	+	+	+	+	-	+	
	CCl ₄	+	+	+	-	+	+	
	Stoddard solvent	-	+ ¹⁴	-	ND	+/- ¹⁵	+	

⁸ Not reviewed in IRIS.

⁹ Ammonia, Nitrogen dioxide, sulfur dioxide, silica, ozone, grinding (stone, tile, concrete); rock, concrete or brick dust.
¹⁰ Possible chemical risks include ingestion of the rodenticide Vactor; chronic arsenic ingestion; dioxin (TCDD).

¹¹ Recognizes possible kidney damage from hexavalent chromium compounds.
¹² Recognizes reports of subclinical low molecular weight proteinuria.

¹³ Recognizes acute renal injury, but not chronic renal insufficiency.
¹⁴ Recognizes damage in high dose animal studies.
¹⁵ Notes "kidneys may be affected."

¹⁶ Recognizes possible but unestablished association.

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Mesothelioma	Asbestos	+	+	+	+	+	+	
Lung Cancer	Asbestos	+	+	+	+	+	+	
	Nickel (insoluble)	+	+	+	+	+	+	
	Beryllium	+	+	+	+	+	+	
	Silica	+	+	ND	ND	+ ¹⁸	+ ¹⁹	
	Diesel exhaust	+	ND	ND	+	+ ²⁰	+ ²¹	
	Chromium VI	+	+	+	+	+ ²²	+ ²³	
Peripheral neuropathy	n-Hexane	+	+	+	+	+ ²⁴	+	
	Lead	+	+	+	- ²⁵	+	+	
	Mercury	+	+	+	+	-	+	

¹⁷ Nickel subsulfide.

¹⁸ NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica, (2002).

¹⁹ IARC, Group 1A, (1997) [IARC index: <http://www.inchem.org/pages/iarc.html>].

²⁰ NIOSH Current Intelligence Bulletin 50, (1988).

²¹ IARC, Group 2A, (1989).

²² NIOSH list of "potential human carcinogens."

²³ IARC, Group 1 (1990).

²⁴ NIOSH Current Intelligence Bulletin 48 (1987).

²⁵ Not reviewed in IRIS.

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Disease	Exposure	NLM Hazmap	ACGIH Doc. of TLV	ATSDR Toxic Profile	EPA IRIS	Agency or Authority	WHO/IPCS (EHC)	Comment
CNS (Chronic encephalopathy)	Organic solvents	+	ND	ND	ND	+	+ ²⁶	
	Lead	+	+ ²⁷	+	- ²⁸	+	+	
	Mercury	+	+	+	+	+	+	
Asthma	Isocyanates	+	+ ²⁹	ND	+ ³⁰	+ ²⁸	+ ²⁸	
	Chromium	+	-	+	-	+	+	
	Welding fumes	+ ³¹	ND	ND	ND	- ³	ND	
	Metal working fluids	+ ³²	ND	ND	ND	+ ³³	ND	
	Nickel	+	+ ³⁴	+	- ²⁶	+	+	
	Formaldehyde	-	- ³⁴	-	- ²⁶	+ ³⁵	+ ³¹	
Asthma	Respiratory irritants	+	ND	ND	ND	ND	ND	
	Diesel exhaust	+	ND	ND	-	+ ³⁶	+	
	Platinum	+	+ ³⁷	ND	ND	+ ³⁸	+	
	Vanadium	-	- ³⁷	-	- ³⁸	+ ³⁹	+	
	Epoxy resins	+	ND	ND	ND	ND	ND	

²⁶ Stoddard solvent as a representative class.

²⁷ Recognizes acute encephalopathy.

²⁸ Not reviewed in IRIS.

²⁹ Toluene isocyanates as a representative class.

³⁰ Toluene isocyanates.

³¹ Irritant-induced asthma.

³² Oil mists, mineral.

³³ NIOSH Criteria for a Recommended Standard: Occupational Exposure to Metalworking Fluids (1998).

³⁴ Recognizes possible relationship.

³⁵ Recognizes sensitization of the respiratory tract.

³⁶ NIOSH Current Intelligence Bulletin 50, (1988).

³⁷ Recognizes possible association.

³⁸ Not reviewed in IRIS.

³⁹ Bronchitis with rhonchi resembling asthma.